

Letter from Alexander Graham Bell to Mabel Hubbard Bell, October 8, 1896, with transcript

ALEXANDER GRAHAM BELL TO MABEL (Hubbard) BELL Beinn Bhreagh, C. B.

Thursday, October 8, 1896. Dear Mabel:

Could not write last night. Have not been feeling very well. You have been away and I had nobody to wake up and call me to bed by four o'clock — so have been irregular — with the usual consequences.

Went to bed last night at ten. Tonight — at nine. Have just got up to write to you. Have taken possession of your morning-room.

Northeast storm has kept the May Queen from running for two days. Just received your Boston note scolding me for what I have not done. Have honestly tried to write to you every night and have sent you more letters since you left — than I have written with my own hand during the last six months to others. Feel quite discouraged by your remarks. Letters take so long to reach their destination that it takes all the life out of correspondence.

Telegrams speak the language of the present. Your letters and mine are five days old at least — before they are read.

Will have to give up. My note-books have suffered — and after all I don't suppose you will read half of what I have written. I can't give you interesting items — and can only tell you what I am thinking about — not very interesting stuff for others.

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We have had so much rain recently as to reveal all the hidden springs on the mountain. Found one on Tuesday — directly above the reservoir — at a considerable elevation — discharging as much water as now comes in to the reservoir from the trough.

Comes directly out of the ground above the new road — at its last turn up the face of the Point. A little hollow in the woods — ground dry all about. I suppose it must have been dry until the recent rains developed its presence — otherwise it surely would have been noticed when we searched for water at the Point. Would be of great importance to us if it could be developed into a permanent source of water. Have given instructions to sink a well there with a siphon in it — to siphon out the contents as soon as full.

Then water rises to level of dotted line — the siphon will begin to work and if the spring is not a good one will soon empty the well. Then the siphon will stop discharging water until the level of the dotted line is again reached — when discharge will again take place. My object will be to keep emptying the well — so as to promote the flow of water from the surrounding ground into the empty space. This should lead to the gradual clearing out of the fine subterranean channels through which the water finds its way into the well — and thus to the collection of the water from a larger and larger (subterranean) area. Think, in 3 this way, we will be sure to increase the flow — and perhaps convert the well into a permanent spring — of importance to the water supply of the house.

You have read, I presume, of the wonderful Indian Jugglers, who are said to throw a rope up into the air — and then send a boy up the rope into the sky! People have to resort to all sorts of explanations — as absurd as the statement itself — to make any one believe that such a thing — had ever — even apparently — been seen. Hypnotized spectators — suggestion and etc., etc.

But there is a spider that really performs this wonderful feat. Holding on to the topmost twig of a bush — with his spinneret pointed to the sky — he discharges a silken rope upwards — which is supported by the wind — until a sufficient length has been let out to support

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the creature itself — when he — it — No — she lets go and sails off into the air. The spider has been seen in the air climbing up his silken rope.

I used to see lots of these spiders in England and Scotland when I was a boy.

I am finding out in the laboratory that a great deal has yet to be learned concerning the best way to combine aero-planes or aero-curves — so as to gain the full benefit of the surfaces. Direct super-position is certainly not the best arrangement.

The effect of the air currents due to the propellers also affects the result profoundly. Every experiment shows the importance of the discovery that the propellers should not be so located as to draw air from under the wings. In such a case they draw away a portion of the support — and thus reduce the lift of the wings.

On the other hand — if the propellers draw air from above the wings — they remove a portion of the obstacle to ascent and increase the lift.

There is a principle involved here — that has not been hitherto recognized. As I glance through the illustrations of proposed flying machines in Channte's book, and in Means' Annual for 1895 and 1896 — I find that in all cases — the propelling power draws air from under the proposed supporting surfaces.

This is true also of Langley's machine — and Maxim's Giant.

I am now investigating the lifts produced by blowing air horizontally from the upper surfaces of horizontal planes. Have made some satisfactory experiments and hope tomorrow to try effect of converting the plane surface into an umbrella shaped surface.

The effect is due to the production of a partial vacuum above the surface. Unbalanced atmospheric pressure from below then yields a lift. This is shown very nicely by a little apparatus we made yesterday. Simply a U shaped tube — containing a light liquid. (We

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used kerosene oil — I propose to try alcohol — that will be lighter — but it may prove to 5 be too volatile for our purpose.)

Connected a rubber-tube to one end of the U shaped glass-tube — and carried the open end of the rubber-tube to upper surface of plane. The liquid in that leg of the glass tube stood about $\frac{1}{4}$ of an inch higher than in the other — showing that a partial vacuum existed above.

As atmospheric pressure equals 2160 pounds on every square foot of surface it is obvious that a very slight reduction of atmospheric pressure above the surface might cause an enormous lift.

In our experiments — the lifts so produced — have been very small — (from 30 to 70 grammes - 1 pound = 454 grammes!) — but the kind of effect is produced — and calculation shows the enormous possibilities of lift in this way.

At present only a differential effect is produced — for explanation of the air currents by means of tobacco smoke — shows that air is dragged indirectly from under the plane surface — as well as directly from above it.

An umbrella shaped surface will probably prevent this.

I think my mother might be interested in my letters — please show them to her. I have just received a nice letter from her.

Miss McCurdy wants me to stop at Truro and address a convention of Nova Scotia teachers upon the subject of Parents' Associations.

Your loving husband, Alec.